500ACS-L/H ANNOUNCEMENT CONTROL SYSTEM

SYSTEM HARDWARE

>> **IT IS THE RESPONSIBILITY OF THE INSTALLER TO OBSERVE THE GUIDELINES AND PROCEDURES DESCRIBED IN THESE INSTRUCTIONS, AND TO USE GOOD ENGINEERING PRACTICE IN THE INSTALLATION OF THIS IED EQUIPMENT. FAILURE TO DO SO MAY RESULT IN IMPROPER OPERATION, AND/OR DAMAGE TO THE EQUIPMENT, AND WILL VOID THE WARRANTY.**

For initial installation read the next two sections, Mounting Guidelines and General Setup Procedure. Also refer to the applicable figures following the text portion of this document.

MOUNTING GUIDELINES

In order to maintain proper airflow for component cooling, the following guidelines for mounting of major system components must be observed:

1. If only one mainframe is used, it should be mounted directly above the 400PS Power Supply Assembly, with no empty rack spaces between. See Figure 3 or 6.
2. If an expansion mainframe is to be used, one mainframe should be mounted directly above the power supply assembly, and one directly below, with no intervening empty rack spaces. See Figure 4 or 7.
3. Equipment mounted directly above the uppermost mainframe or directly below the lowermost mainframe must not materially impede airflow. It should be of open construction, similar to the mainframes, without a top or bottom plate.

GENERAL SETUP PROCEDURE FOR SYSTEMS USING THE 510CPU

The 500ACS is shipped from the factory with all plug-in cards installed. The function cards are jumper addressed and must be installed in the particular slot for which they are addressed. To perform voltage checks or other testing, do not remove any of the cards completely unless necessary. With power off, simply pull them forward enough to unplug them, so that they clear the card edge connector. If it becomes necessary to remove one or more cards, be sure to make a note of the slot from which it/they were removed. As an aid, refer to Figure 3. The 510CPU always plugs into slot 13, the slot furthest to the right as viewed from the front. 500C cards always plug into 500FT terminal strips. 500D and 500DR cards always plug into 500GT terminal strips. The 500R card always plugs into a 500RT terminal strip which is usually mounted between the group of 500C cards and 500D/DR cards. If a 510N Dynamic Audio Network Card is used, it always plugs into a 510NT terminal strip usually mounted immediately to the right of the 500RT as seen from the rear of the mainframe. See Figure 3. The function of the 510N is network communications between ACSs in multi ACS systems, with 518 Series Digital Microphone Stations, and with Titan® Series Digital Distribution Products.

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1. If a single mainframe is used, connect it to the 400PS Power Supply System as shown in Figure 3. If two mainframes are used, connect them to the 400PS Power Supply System as shown in Figure 4. In either case connections are made using 400CA2 cables which are supplied with the 500M Mainframes. If a third mainframe is used, 400CA3 cables, a longer version of the 400CA2 cables, will be provided.

2. With NO plug-in cards plugged in, power up the 400PS Power Supply Assembly. If there is an external power switch, first plug the power cord into the AC power connector on the 400PS and into the AC power outlet. Power up by turning on the switch. If there is no external power switch, first plug the power cord into the AC power connector on the 400PS. Then, power up by plugging the power cord into the AC power outlet.

3. Verify fan operation in the 400PS when powered up.

4. Check voltages on the 500M mother board. If more than one mainframe is used, check voltages on the others, as well. See Figure 3. for the location of the voltage test points. Acceptable voltage levels are shown in table below. If there is a power supply problem the 400PS will beep and a red LED will flash on the 452CPU.

TEST POINT	ACCEPTABLE VOLTAGE RANGE (Measured between test point and Ground)
+5V	4.75 V to 5.25 V
+15V	14.75 V to 15.25 V
–15V	–14.75 V to –15.25 V
+30V	0 (Not used in new systems)

Table 1 - Acceptable Test Point Voltages

5. After completing all voltage checks, **power down the 400PS.**

6. The 500M has 13 usable slots. The card slots are numbered from 1 to 13 with slot 1 being on the left as viewed from the front. Slot 13, the rightmost slot is the only slot in which the 510CPU can be mounted. The 510CPU requires ±12 VDC. All other cards in the system operate on ±15 VDC. To prepare slot 13 for the 510CPU card, two jumpers must be placed in the CPU position. See Figure 1 for location of the jumpers. **If the CPU is plugged into slot 13 with the jumpers in the IED position, or if it is plugged into any other slot, the card will be damaged and the warranty will be voided.** As a precaution, the 510CPU can be removed from the system and voltages on the card edge connector can be measured to be sure that the proper voltages are present in the 510CPU connector. See Figure 2 for the locations of voltages which can be measured. If the 500M is being used as an expansion mainframe, the jumpers should be set in the IED position so that other function cards such as the 500C or 500D cards can be used in this slot.

7. Provided that voltages and fan operation were found to be correct, plug in all cards using the Mainframe Layout Chart supplied with the system as a guide.

8. Install the audio bus ribbon cables between the 500C cards and the 500R. See Figure 5. In all cases, follow the Mainframe Layout Chart. Be sure that the red stripe faces the front of the mainframe. These cables are supplied with the system and are custom made at IED for each specific application.

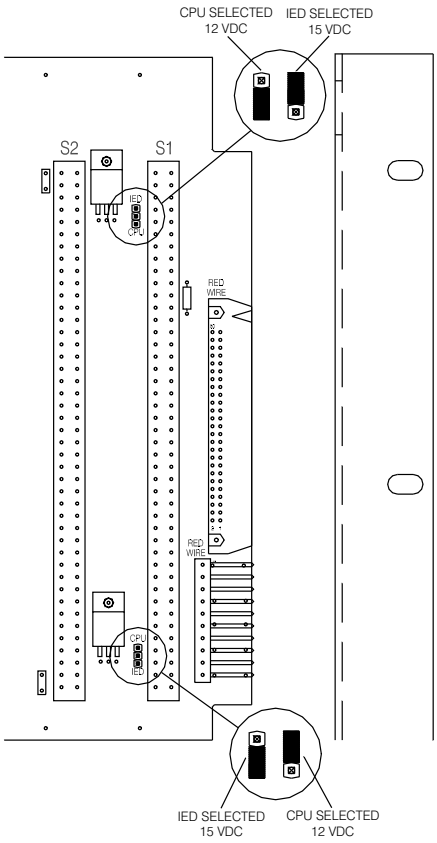

Figure 1 - CPU Card Voltage Jumpers
on 500M Motherboard near slot 13

9. Install the audio bus ribbon cables between the 500D cards and the 500R. See Figure 5. In all cases, follow the Mainframe Layout Chart. Be sure that the red stripe faces the front of the mainframe. These cables are supplied with the system and are custom made at IED for each specific application.

10. Plug the 500CA6 cable into the Ethernet connector on the back of the 510CT. Refer to Figure 5. If it does not plug in easily, turn it 180°. **Forcing or plugging in upside down will damage the 510CT and void the warranty.** Connect the other end to the Network Switch. Refer to Figure 5.

11. If using the 510N, plug a 500CA6 cable into the back of the 510NT. Connet the other end to the Network Switch. See Figure 5.

12. Connect the 500R lower connector to the 510CPU with the 500CA5 cable. See Figure 5. Make sure that the red stripe is up at the 510CPU and oriented correctly on the 500R. See Figure 5.

13. Plug one end of a 500CA6 Cable into the rear of the 590R Computer. Plug the other end into the IED 0904 Network Switch. Refer to Figure 5.

14. Plug the cable attached to the keyboard into the 500VS4L/H Video/Keyboard Switcher, keyboard connector, console position. Refer to Figure 5.

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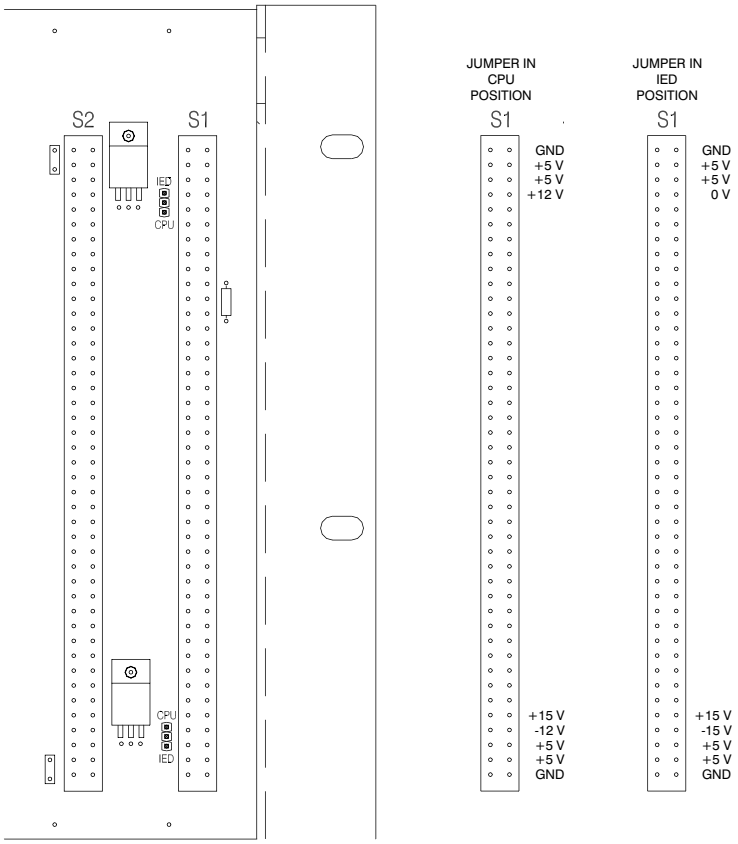

Figure 2 - CPU Card Voltages
on 500M Motherboard near slot 13

15. Plug the video cable attached to the monitor into the 500VS4L/H Video/Keyboard Switcher, monitor connector, console position. Refer to Figure 5.

16. Switch to Port 2 on the KVM, turn on power and watch the monitor for a normal boot sequence with no error messages. It should progress automatically to the program screen, and activity should be seen in the lower right-hand corner.

GENERAL SETUP PROCEDURE FOR SYSTEMS USING THE 500CPU-486

The 500ACS is shipped from the factory with all plug-in cards installed. The function cards are jumper addressed and must be installed in the particular slot for which they are addressed. To perform voltage checks or other testing, do not remove any of the cards completely unless necessary. With power off, simply pull them forward enough to unplug them, so that they clear the card edge connector. If it becomes necessary to remove one or more cards, be sure to make a note of the slot from which it/they were removed. As an aid, refer to Figure 8. The 500CPU-486 always plugs into slot 13, the slot furthest to the right as viewed from the front. The 500P always plugs into slot 12, just to the left of the CPU. 500C cards always plug into 500FT terminal strips. 500D and 500DR cards always plug into 500GT terminal strips. The 500R card always plugs into a 500RT

terminal strip which is usually mounted between the group of 500C cards and 500D/DR cards.

1. If a single mainframe is used, connect it to the 400PS Power Supply System as shown in Figure 6. If two mainframes are used, connect them to the 400PS Power Supply System as shown in Figure 7. In either case connections are made using 400CA2 cables which are supplied with the 500M Mainframes. If a third mainframe is used, 400CA3 cables, a longer version of the 400CA2 cables, will be provided.

2. With NO plug-in cards plugged in, power up the 400PS Power Supply Assembly. If there is an external power switch, first plug the power cord into the AC power connector on the 400PS and into the AC power outlet. Power up by turning on the switch. If there is no external power switch, first plug the power cord into the AC power connector on the 400PS. Then, power up by plugging the power cord into the AC power outlet.

3. Verify fan operation in the 400PS when powered up.

4. Check voltages on the 500M mother board. If more than one mainframe is used, check voltages on the others, as well. See Figure 6. for the location of the voltage test points. Acceptable voltage levels are shown in table below. If there is a power supply problem the 400PS will beep and a red LED will flash on the 452CPU.

TEST POINT	**ACCEPTABLE VOLTAGE RANGE** (Measured between test point and Ground)
+5V	4.75 V to 5.25 V
+15V	14.75 V to 15.25 V
–15V	–14.75 V to –15.25 V
+30V	0 (Not used in new systems)

Table 2 - Acceptable Test Point Voltages

5. After completing all voltage checks, **power down the 400PS.**

6. The 500M has 13 usable slots. The card slots are numbered from 1 to 13 with slot 1 being on the left as viewed from the front. Slot 13, the rightmost slot is the only slot in which the 500CPU-486 can be mounted. The 500CPU-486 requires ±12 VDC. All other cards in the system operate on ±15 VDC. To prepare slot 13 for the 500CPU-486 card, two jumpers must be placed in the CPU position. See Figure 1 for location of the jumpers. **If the CPU is plugged into slot 13 with the jumpers in the IED position, or if it is plugged into any other slot, the card will be damaged and the warranty will be voided.** As a precaution, the 500CPU-486 and the 500P cards can be removed from the system and voltages on the card edge connector can be measured to be sure that the proper voltages are present in the 500CPU-486 connector. See Figure 2 for the locations of voltages which can be measured. If the 500M is being used as an expansion mainframe, the jumpers should be set in the IED position so that other function cards such as the 500C or 500D cards can be used in this slot.

7. Provided that voltages and fan operation were found to be correct, plug in all cards using the Mainframe Layout Chart supplied with the system as a guide.

8. Install the audio bus ribbon cables between the 500C cards and the 500R. See Figure 8. In all cases, follow the Mainframe Layout Chart. Be sure that the red stripe faces the front of the mainframe. These cables are supplied with the system and are custom made at IED for each specific application.

9. Install the audio bus ribbon cables between the 500D cards and the 500R. See Figure 8. In all cases, follow the Mainframe Layout Chart. Be sure that the red stripe faces the front of the mainframe. These cables are supplied with the system and are custom made at IED for each specific application.

10. Plug the 500CA3 RS422 Cable into the Ethernet connector on the front edge of the 500CPU-486 card. Refer to Figure 8. The other end is fed through to the back of mainframe using the space between the top of the mother board and the top of the mainframe. It is then plugged into the IED 0902 10Base-T Ethernet Transceiver. The connector that plugs into the 500CPU-486 card is keyed. If it does not plug in easily, turn it 180°. **Forcing or plugging in upside down will damage the 500CPU-486 card and void the warranty.**

11. Connect the 500P card to the 500CPU-486 using the 500CA4 cable supplied. See Figure 8.

12. Connect the 500R lower connector to the 500CPU-486 with the 500CA5 cable. See Figure 8. Make sure that the red stripe is down at the 500R and up at the 500CPU-486.

13. Plug the 500CA1 Keyboard/Mouse Adapter Cable into the Keyboard/Mouse connector on the front edge of the 500CPU-486 card. Refer to Figure 8. The other end with the two connectors is fed through to the back of mainframe using the space between the top of the mother board and the top of the mainframe.

14. Plug the 500CA2 VGA Adapter Cable into the VGA connector on the front edge of the 500CPU-486 card. Refer to Figure 8. The other end is fed through to the back of mainframe using the space between the top of the mother board and the top of the mainframe.

15. Plug one end of a 500CA6 Cable into the IED 0902 10Base-T Ethernet Transceiver. Plug the other end into the IED 0904 Ethernet Switch. Refer to Figure 8.

16. Connect one end of a 500CA7 Monitor Extension Cable to the end of the 500CA2 Adaptor Ribbon Cable which was previously fed through to the back of the mainframe. Connect the other end to the 500VS4L/H Video/Keyboard Switcher, monitor connector of CPU 1. Refer to Figure 8.

17. Connect one end of a 500CA8 Keyboard Extension Cable to the keyboard connector end of the 500CA1 Adaptor Ribbon Cable which was previously fed through to the back of the mainframe. Connect the other end to the 500VS4L/H Video/Keyboard Switcher, keyboard connector of CPU 2. Refer to Figure 8.

18. Plug one end of a 500CA6 Cable into the rear of the 590R Computer. Plug the other end into the IED 0904 Ethernet Switch. Refer to Figure 8.

19. If the system consists of multiple ACSs with a fiber optic link, plug one end of a 500CA6 Cable into the IED 0900 10Base-T Fiber Optic Transceiver. Plug the other end into the IED 0904 Ethernet Switch. Refer to Figure 8. Make the necessary fiber optic connections between transceivers.

20. Connect one end of a 500CA7 Monitor Extension Cable to the end of the monitor connector on the rear of the 590RU-DOS gateway Rack Mount Computer. Connect the other end to the 500VS4L/H Video/Keyboard Switcher, monitor connector of CPU 3. Refer to Figure 8.
21. Connect one end of a 500CA8 Keyboard Extension Cable to the keyboard connector on the rear of the 590R Windows Rack Mount Computer. Connect the other end to the 500VS4L/H Video/Keyboard Switcher, keyboard connector of CPU 1. Refer to Figure 8.
22. Plug the cable attached to the keyboard into the 500VS4L/H Video/Keyboard Switcher, keyboard connector, console position. Refer to Figure 8.
23. Plug the video cable attached to the monitor into the 500VS2L/H Video/Keyboard Switcher, monitor connector, console position. Refer to Figure 8.
24. Switch to Port 2 on the KVM, turn on power and watch the monitor for a normal boot sequence with no error messages. It should progress automatically to the program screen, and activity should be seen in the lower right-hand corner.

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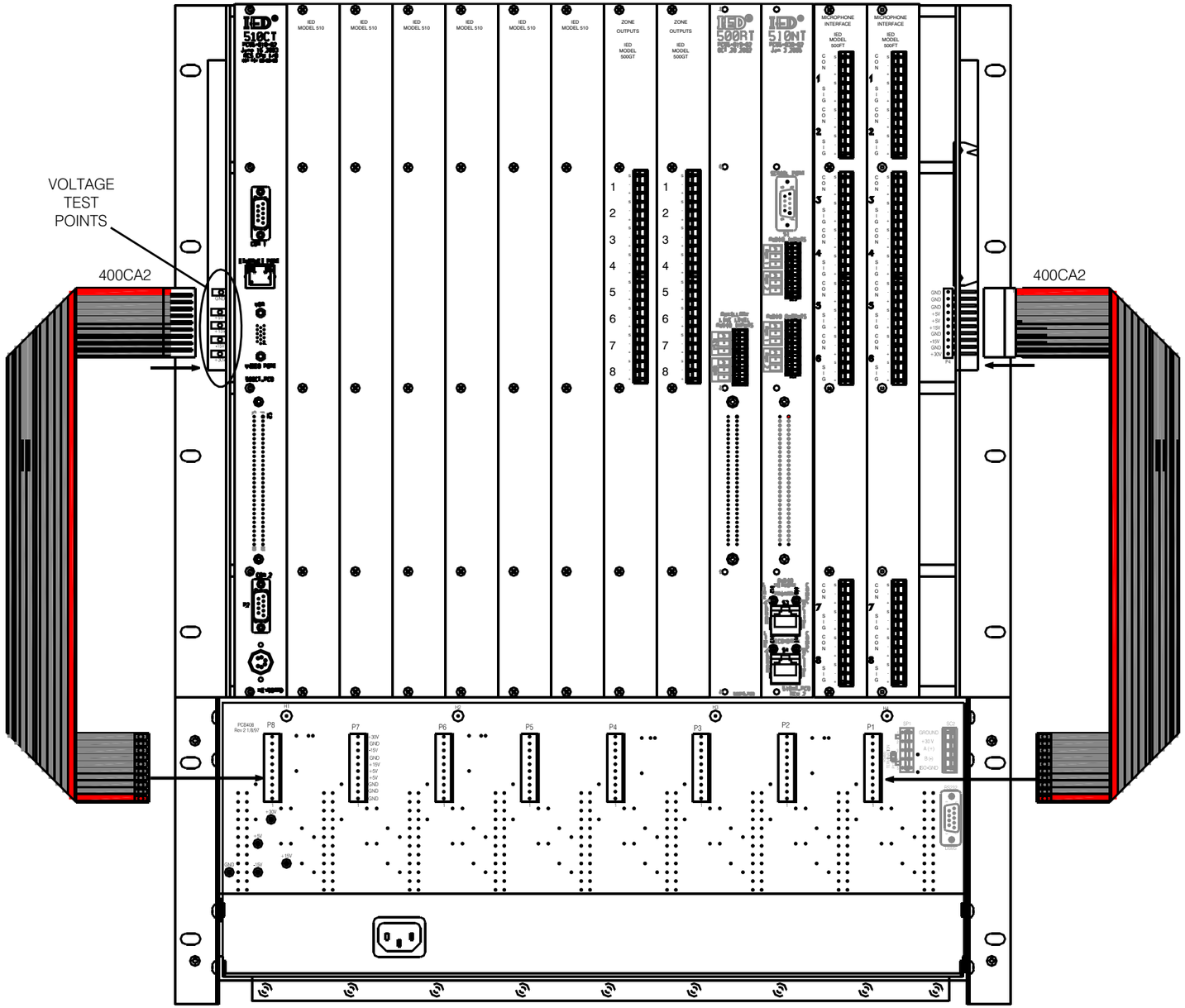

Figure 3 - Typical Power Cable Interface
For Single Mainframe ACS Systems with 510CPU

Figure 4 - Typical Power and Multibus Cable Interface
For Multiframe ACS Systems with 510CPU, Rear View

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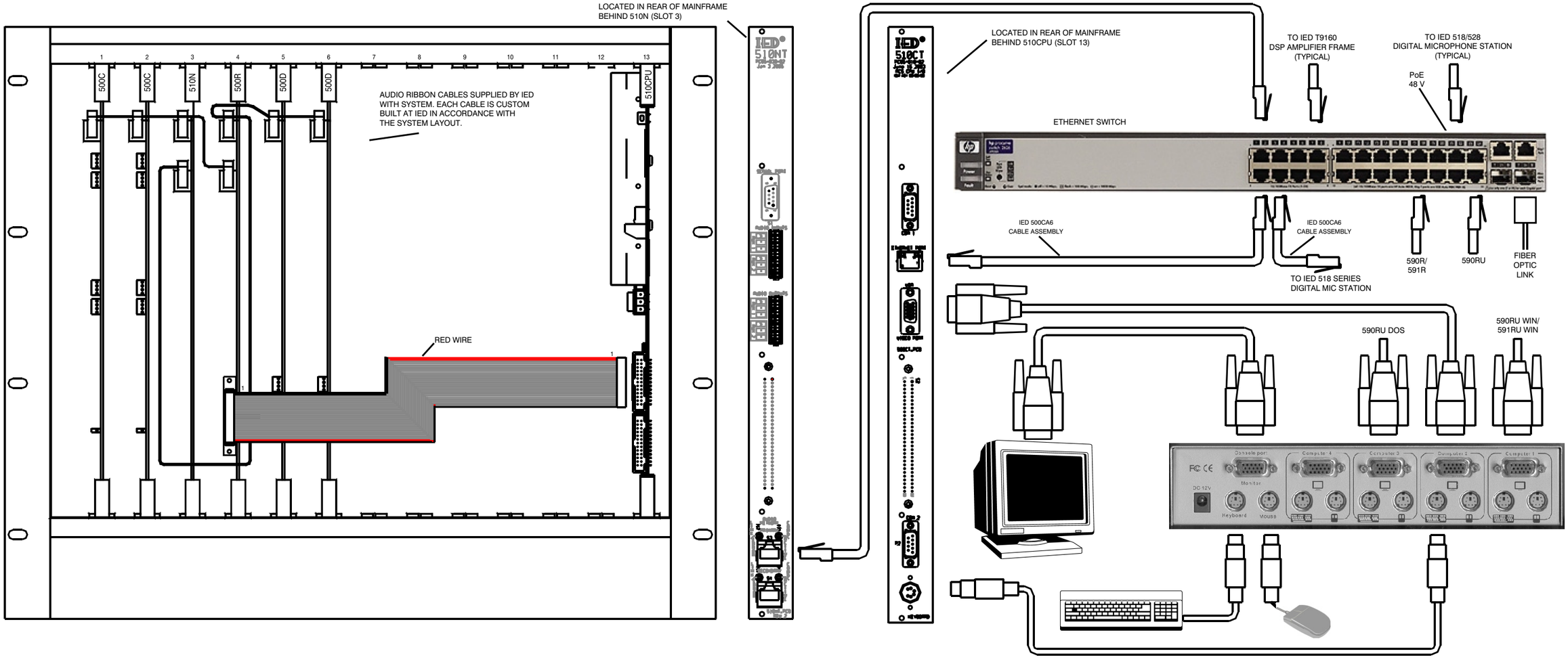

Figure 5 - 500ACS With 510CPU
Internal and External Cable Connections

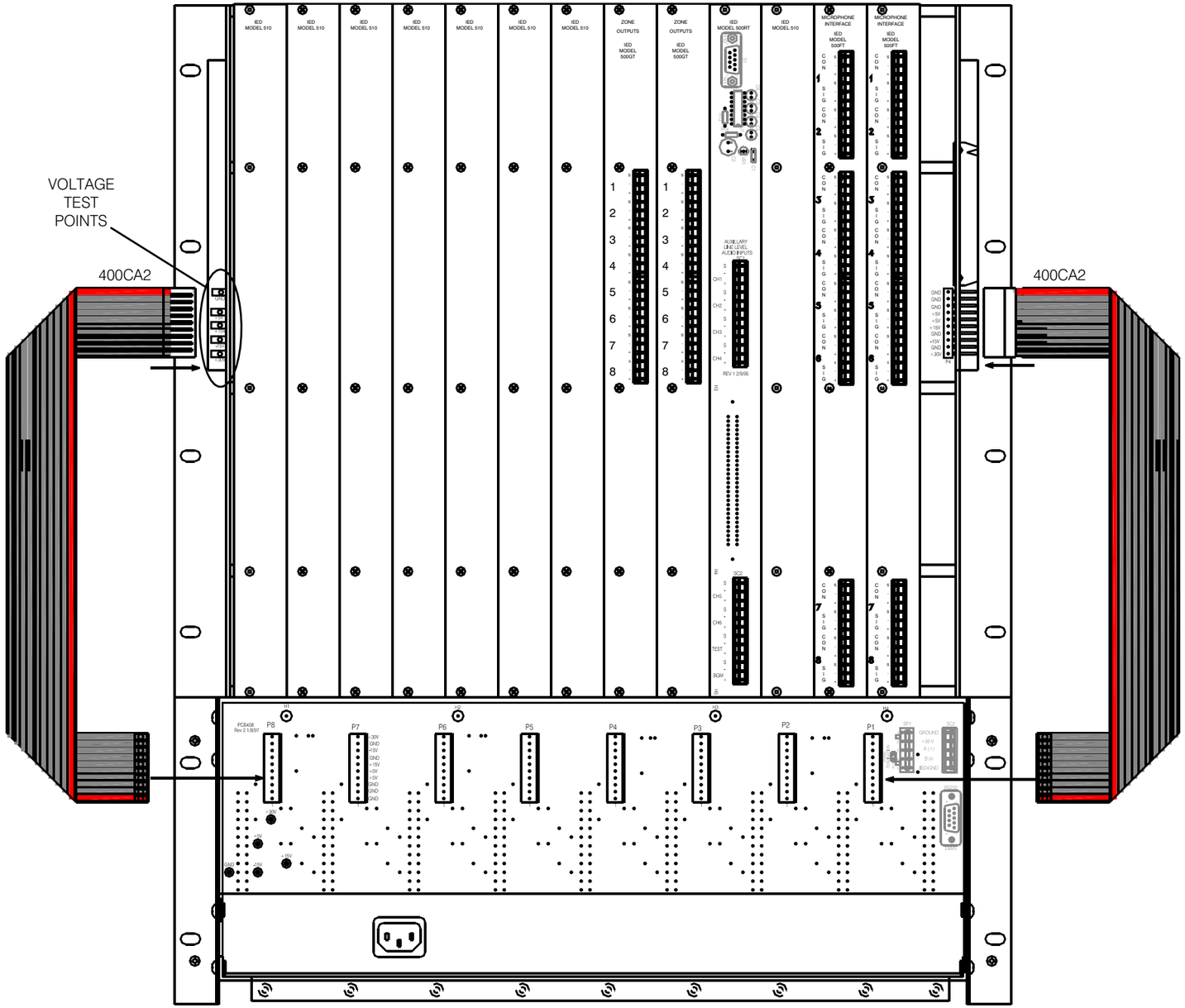

Figure 6 - Typical Power Cable Interface
for Single Mainframe ACS Systems with 500CPU-486

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Figure 7 - Typical Power and Multibus Cable Interface
for Multiframe ACS Systems, Rear View with 500CPU-486

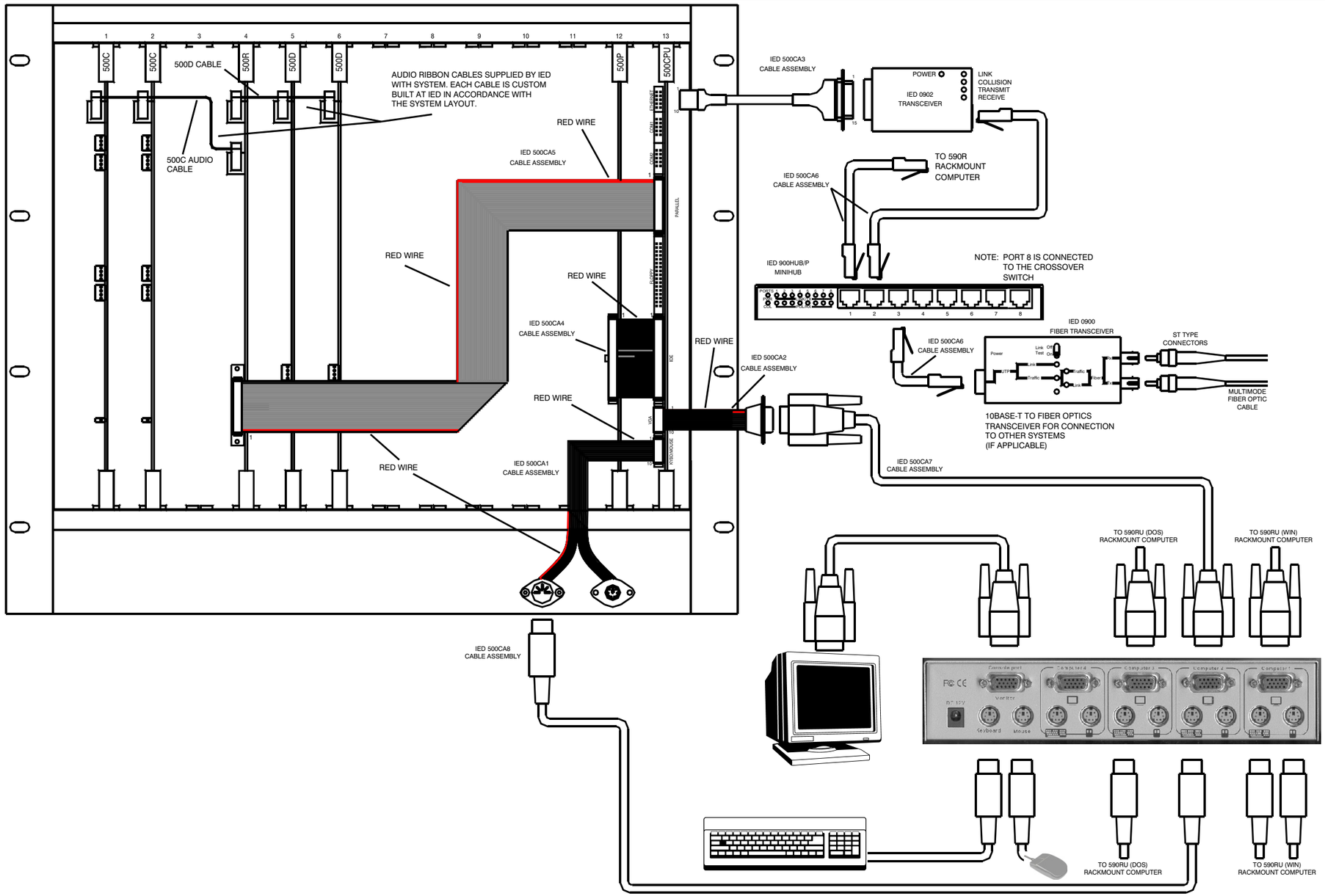

Figure 8 - 500ACS With 500CPU-486
Internal and External Cable Connections

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